Invention Proposal

THE DOCUMENT COMPANY
XEROX

IP 990592

To: Xerox Intellectual Property Department

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(SEND ORIGINAL TO THE INTELLECTUAL PROPERTY DEPARTMENT AND A COPY TO YOUR MANAGER)

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Manager	Electronic Mail Address	Bldg. No./MS	Name of Xerox Program (if any)
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Descriptive Title of Proposal
An Active Annotation Mechanism for Document Management Systems

Provide a brief summary or abstract of the invention, specifically pointing out the features you think are new:

Most document systems provide an annotation system so that people can add notes of interest to documents. This invention describes a mechanism whereby these notes can be made active, so that they can used to do effect document actions, such as document filing/storage, and document distribution. This mechanism allows activity to be associated with documents even when accessed using traditional, non-active applications.

Provide here, using added pages, a more detailed technical description of your invention, including the advantage(s), and the problem(s) solved by the invention, and how each is accomplished. Please indicate the current methods or techniques used to solve the problem(s), and the deficiencies of these methods or techniques. Sketches, drawings, notebook pages, memos, or photos can be very helpful and should be attached if possible:

Background

Annotation is a common feature of document practice. As people read documents, they often annotate the document with a variety of related items of information, by writing notes in margins or on the front of the document, by underlining, circling and otherwise "marking up" the text. In electronic document systems, annotations make take the form of in-line commentaries, or out-of-band notations such as linked comments or marginal notes. Annotations include commentaries on the text, notes of other related items, and consequences for future activity.

This invention concerns this third form. Examples might include notes to send copies of the document or extracts of the document to other people; indications of how this document should be filed; or indications of what should happen to the document next.

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Submitter(s) Signature(s)	Date

Exhibit A

In other words, these annotations have consequences for futher operations in the system, such as the distribution of the document. However, unless the application in which the annotations are created is aware of both the nature of the annotation content and the other applications whose behaviour should be coordinated, there is no way to provide this active link between applications.

Invention

This invention proposes a mechanism for activating annotations. The mechanism interposes itself between the document and the repository in which the document is stored, or else is activated when document storage takes place. This allows the mechanism to become aware when documents are stored with new annotations.

When a document is stored in the repository, the mechanism is invoked. It scans the document for new annotations, and examines the content of the annotations. It parses the annotations to look for commands that have some active consequences, and carries out the actions. Annotations can carry both the indication of an activity to be carried out (e.g. "email") and a parameter that configures that activity (e.g. "to bill").

Note that annotations need not be stored separately from the content of the document. An annotation might, itself, be simply part of the document content. So, this mechanism operates over the content of any document, such as plain text files, program source code, presentations, etc.

Scenario

During a long plane flight, Bob is catching up on his reading using his portable document reader, which has been loaded with documents awaiting his attention. He reads a background report about a competeing product, and notes in the margin "Send a copy to David". Next, he reads a budget request for a new server; he notes, "Status: approved" across the top. Finally, he reads a competetive analysis of the product development process at other companies, and notes "file with process planning" in the margins. He makes the annotations using his standard mark-up tool.

When he docks his Portable Document Reader, the files are checked in to his document management system. The active annotation mechanism scans the documents and notices that they've been annotated. It reads the annotations, and performs the actions. A copy of the background article is sent to David as an email attachment; a workflow system is updated to reflect the fact that the equipment request has been approved, and it generates a purchase order; and the list of documents related to the new process planning activity is updated with the competetive analysis, causing other interested parties to receive an email notification.

Implementation

An implementation has been constructed using the Placeless Document system. Placeless Documents is a document management system in which documents are organised according to arbitrary properties that can be associated with them by users or by applications. Properties can contain active code which is invoked when operations are performed on the documents.

One of the operations that active properties can observe is document updates. The prototype implementation scans documents after they have been changed by intercepting this operation. The document content is scanned for annotated comments. These comments are interpreted and used to control a workflow engine which is managing the documents. In this way, the workflow system can be controlled by operating directly on the documents rather than having to use a separate "workflow" end-user application.

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The Placeless Documents system already provides for active properties to be associated with documents. This invention and implementation allows a similar form of "activation" to be associated with document *content.*

Benefits

There are three main benefits to this approach.

First, those annotations which carry consequences for future activity can now be made to *carry out* those consequences without any further action on the part of the user, even in document applications whose content is normally static.

Second, these active annotations can coordinate the behaviour of multiple applications, even though those applications have no direct link to each other.

Third, the document system need not even provide an explicit annotation mechanism; by scanning document content, the active annotation mechanism can extract relevant directives from the document content itself. Activating in-line annotations extends the range of this invention beyond systems that provide explicit annotation mechanisms.

Fourth, since the activity is associated with document content, rather than a specific application for accessing the document, it can operate independent of the application used. In-line textual annotations will take effect whether the document is edited with emacs, Notepad, Word, SimpleText or any text-capable editor.

Related Work

Annotations in themselves are far from new. Most document systems, from word processors to web browsers, provide some mechanism for annotations. Microsoft Word, for instance, offers a "comment" feature allowing annotations to be added to parts of a document. In some systems, comments can be "active" through the use of multimedia content. Some work has been carried out at Eurecom exploring Java objects as document annotations. However, these approaches differ from this invention in that (1) they require adaptation of the original application, (2) they concentrate on the display properties of annotations.

DAE uses Xerox glyphs to support the activation of otherwise static paper documents. This allows for active processing of the page image. The DAE approach differs from this invention in that its annotations cannot be added directly by users, and that applications must be enhanced to be able to include glyphs in documents.

The Placeless Documents system already provides for active objects to be associated with documents through the active property mechanism. This invention extends this idea into the domain of document content.

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Name of others known to have worked on this or a similar invention:

Identify any known similar, or related invention Proposals, patents or publications, Xerox or non-Xerox commercial products, or indicate none:
Active properties are the subject of a number of existing patent filings generated by the Placeless Documents project.

Has a model, a prototype, or experiment of the invention been built, made, run or tested ? ☒ Yes ☐ No
The active annotation mechanism has been implemented as part of , a prototype workflow system built on top of the Placeless Documents infrastructure.

Is the invention used in a current product(s) or planned for use in a future product(s) ? ☐ Yes ☒ No
If so, please identify the program(s) or product(s), and introduction dates:

Indicate the date(s) of any previous or planned future disclosure external to Xerox, (has the invention been disclosed, or is it planned for disclosure outside of Xerox) and identify the type of disclosure (by agreement, demonstration, paper or presentation given, market probe, published article, etc., and if convenient, please provide a copy of the agreement, paper or article):

Source of outside funding, if any:
None

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Submitted/Conceived By	Date

XEROX DocuLock Forever

Manager's Comment Section

Submitter(s):	J PAUL DOURISH
Title of Invention	An Active Annotation Mechanism for Document Management
Manager's Name	Kara Petersen
Date	

1. Problem addressed or function provided by the invention:

Example 1A: Finisher cost reduction *Example 1B: Uses low cost LCD to write annotation messages*

That annotations on documents often specify that an action needs to take place, but a separate activity by the user is needed to perform the action

2. Central thrust of the invention:

Example 2A: Design incorporates fewer parts *Example 2B: Uses low cost LCD to write annotation messages*

That annotations themselves can carry out the desired activity

3. Could invention have impact beyond current description?:

Example 3A: Could also function for printer finisher *Example 3B: Could also function to erase/edit copy*

4. Potential for Xerox application. Specify product or technology program if possible:

Example 4A: Mainline approach in Program Q *Example 4B: Adds significant feature to future products*

5. Value to competitors; potential for license or trade:

Example 5A: Enables much lower cost finishing than any known system and opens possibilities of moving finishing down-market *Example 5B: Low cost will be hard to match*

6. Please indicate any related patents, publications, or activities you know of:

All

7. I would recommend the following form(s) of protection: ☒ Patent ☐ Defense publication ☐ Keep trade secret ☐ None

Comments: